

24. The catheter system of claim 23 wherein said catheter distal end is located within said sheath lumen.

25. The catheter system of claim 23 wherein said catheter distal end is located outside said sheath lumen.

C³
26. A method of using a catheter system to remove material comprising:
advancing a sheath having a sheath lumen to a location near material to be removed;
advancing a catheter of the type having a fluid port to eject fluid thus creating a retrograde flow, through said sheath lumen to a location near material to be removed;
injecting fluid into said catheter causing fluid to emerge from the catheter, entraining material located near said catheter;
removing said fluid and entrained flow from said sheath lumen.

REMARKS

Drawings:

Kindly review newly submitted Fig. 7 and Fig. 8. These two figures are photocopies of Fig. 5 reproduced to the catheter operating inside and outside the sheath as described on page 6 at lines 9 through 21 among other places. These drawings are supported by the specification of the case as filed.

The drawing Fig. 1 has been modified to re-label "cap" 19 as cap 91 and corresponding changes are made in the specification, in addition the strut 41 is shaded. These changes are shown in red on the attached drawings for the approval of the

Examiner.

Restriction:

Fig. 1 is a context figure showing the fluid supply source 12 and the fluid collection bag 2 coupled to the catheter and sheath assembly 10. The "bubble" on the drawing 11 is intended to indicate that the distal tip of the catheter and sheath are depicted at a larger scale. Fig. 5 is a unitary version of the Fig. 2 device.

Newly added Fig. 7 and Fig. 8 are Fig. 5 reproduced to show operation inside and outside as described in the spec as filed.

Fig. 6 is the same fluid geometry of Fig. 2 or Fig. 5 turned inside out to save space for some applications of the device.

In consonance with the restriction requirement all the claims amended in this amendment read on Fig. 1,2, 5,6,7,8. Kindly recall that the Fig. 3 and 4 devices each add a supplemental energy source. These are not elected for this examination.

For these reasons Applicant reiterates the election of the embodiments of Fig. 1,2, 5,6,7,8 and claims 11-30 which read on those figures.

Rejection under 102

The claims have been renumbered as required by the Examiner.

The claims have been rejected as anticipated by the Neracher and Willard references. The claims have been amended to clarify the distinctions between Applicant's invention and the prior art.

Like the applicants invention, the Willard and Neracher devices inject fluid to interact with occlusive material. The injected fluid and debris are removed. However the prior art systems differ in important ways from the invention and the claims are amended to point out the distinctions..

In both Willard and Neracher there is an input pump and output pump that are coupled together in a master slave relationship so that the injection pump controls the operation of the output pump. However in contrast , in the applicant's invention the input syringe and the collection bag are completely uncoupled from each other in the mechanical sense. In applicants system the injected fluid entrains ambient fluid and promotes a retrograde flow. The mixing process between the input fluid results in the combined flow being propelled toward the collection bag. However unlike Neracher or Willard the volume removed and the volume injected are not coupled together by external metering pumps.

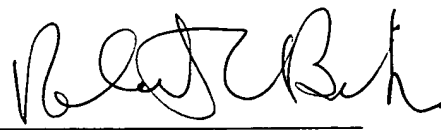
In applicants system the fluid physics in the vessel govern the relations hip between injected and extracted flow. The "uncoupled" nature of input and output volumes is now explicitly recited in the claims.

It should also be seen that the uncoupled relationship is not obvious in view of the references. For example in the lateral jet embodiments of Willard there is no preference of the fluid to leave the body. That is the flow would split and some flow distally and some flow proximally. Without a pump Willard would not reliably extract the injected fluid. In Neracher, the absence of a metering pump would result in debris from the occlusion migrating distally once the occlusion is "opened" up. Thus there is no teaching in either reference to uncouple or remove the output pump.

Date: 8/9/02

ROBERT C. BECK

By his attorneys:





COPY OF PAPERS
ORIGINALLY FILED

Robert C. Beck
Registration No. 28,184
Beck & Tysver, P.L.L.P.
2900 Thomas Avenue S.
Suite 100
Minneapolis, MN 55416
Telephone: (612) 915-9635
Fax: (612) 915-9637

RECEIVED

AUG 23 2002

TECHNOLOGY CENTER R3700